

## CLAIMS

The invention claimed is:

- 1      1. A connector for joining a first piece of sheet metal and a second piece of sheet metal  
2      together end-to-end, wherein said connector has a length and a longitudinal center line,  
3      wherein the first piece of sheet metal has a raw free end with at least one wedge-  
4      shaped reverse button lock projection thereon, and wherein the second piece of sheet  
5      metal has a raw free end with at least one wedge-shaped reverse button lock projection  
6      thereon and a joggle inward of the at least one wedge-shaped reverse button lock  
7      projection thereon, said connector comprising:  
8            a)     a first wall;  
9            b)     a second wall;  
10          c)     a ledge; and  
11          d)     a third wall;  
12          wherein said second wall and said first wall define a first channel therebetween;  
13          wherein said ledge extends inwardly from said second wall;  
14          wherein said ledge extends into said first channel;  
15          wherein said first channel is for lockingly receiving the raw free end of the first piece  
16          of sheet metal by virtue of the at least one wedge-shaped reverse button lock projection  
17          on the raw free end of the first piece of sheet metal spreading said second wall away  
18          from said first wall as the raw free end of the first piece of sheet metal slips through  
19          said first channel until such time as the at least one wedge-shaped reverse button lock  
20          projection on the raw free end of the first piece of sheet metal just clears said ledge  
21          causing said second wall to unspread, and in so doing, causes the at least one wedge-

shaped reverse button lock projection on the raw free end of the first piece of sheet metal to be snapingly engaged onto, and lockingly captured against, said ledge, and in so doing, the first piece of sheet metal is secured in said connector;

wherein said third wall terminates in a free edge;

wherein said free edge of said third wall is folded inwardly onto itself so as to form a folded free edge;

wherein said third wall and said first wall define a second channel therebetween;

wherein said second channel is for lockingly receiving the raw free end of the second piece of sheet metal by virtue of the at least one wedge-shaped reverse button lock projection on the raw free end of the second piece of sheet metal spreading said third wall away from said first wall as the second piece of sheet metal slips through said second channel until such time as the at least one wedge-shaped reverse button lock projection on the raw free end of the second piece of sheet metal just clears said folded free edge of said third wall causing said third wall to unspread, and in so doing, causes the at least wedge-shaped reverse button lock projection on the raw free end of the second piece of sheet metal to be snapingly engaged onto, and lockingly captured against, said folded free edge of said third wall, and in so doing, the second piece of sheet metal is secured in said connector;

wherein said first channel and said second channel open in opposite directions from each other for joining the first piece of sheet metal and the second piece of sheet metal together end-to-end; and

wherein said first channel and said second channel are offset relative to each other, and as a result thereof, requires the joggle on the raw free end of the second piece of sheet metal to offset the second piece of sheet metal so as to allow insertion of the other raw

46 free end of the second piece of sheet metal into said first channel of a next connector  
47 without a need for field dressing.

1    2. The connector as defined in claim 1, wherein said connector is made from one  
2 continuous piece of pliable sheet metal; and  
3 wherein said one continuous piece of pliable sheet metal is bent, rolled, and molded  
4 to form said connector.

1    3. The connector as defined in claim 2, wherein said one continuous piece of pliable sheet  
2 metal has a thickness; and  
3 wherein said thickness of said one continuous piece of sheet metal ranges from  
4 eighteen to twenty-four gauge.

1    4. The connector as defined in claim 2, wherein said one continuous piece of pliable sheet  
2 metal is galvanized sheet steel to combat corrosion.

1    5. The connector as defined in claim 1, wherein said connector is made from extruded  
2 plastic.

1    6. The connector as defined in claim 1, further comprising a fourth wall; and  
2 wherein said fourth wall extends from said ledge to a terminal edge.

1    7. The connector as defined in claim 6, further comprising a flange;  
2 wherein said flange extends outwardly from said fourth wall; and  
3 wherein said flange structurally stiffens said connector.

1       8. The connector as defined in claim 1, further comprising an adhesive sealing  
2       compound;  
3       wherein said adhesive sealing compound material is highly viscous;  
4       wherein said adhesive sealing compound material fills said first channel;  
5       wherein said adhesive sealing compound material adheres to said first channel;  
6       wherein said adhesive sealing compound material is for adhering to the raw free end  
7       of the first piece of sheet metal;  
8       wherein said adhesive sealing compound material is for sealing the raw free end of the  
9       first piece of sheet metal in said first channel against leakage of a material flowing  
10      along the first piece of sheet metal;  
11      wherein said adhesive sealing compound material fills said second channel;  
12      wherein said adhesive sealing compound material adheres to said second channel;  
13      wherein said adhesive sealing compound material is for adhering to the raw free end  
14      of the second piece of sheet metal; and  
15      wherein said adhesive sealing compound material is for sealing the raw free end of the  
16      second piece of sheet metal in said second channel against leakage of a material  
17      flowing along the second piece of sheet metal.

1       9. The connector as defined in claim 1, wherein said first wall is flat;  
2       wherein said second wall is flat; and  
3       wherein said third wall is flat.

1       10. The connector as defined in claim 1, wherein said second wall is parallel to said first  
2                          wall; and  
3                          wherein said third wall is parallel to said first wall.

1       11. The connector as defined in claim 1, wherein said second wall is slightly spaced from  
2                  one side of said first wall so as to allow said first channel to be narrow; and  
3                  wherein said third wall is slightly spaced from the other side of said first wall so as to  
4                  allow said second channel to be narrow.

1 13. The connector as defined in claim 1, wherein said first channel opens laterally so as  
2 to form a lateral opening;  
3 wherein said lateral opening of said first channel is for receiving the raw free end of  
4 the first piece of sheet metal;  
5 wherein said second channel opens laterally so as to form a lateral opening; and  
6 wherein said lateral opening of said second channel is for receiving the raw free end  
7 of the second piece of sheet metal.

1       15. The connector as defined in claim 6, wherein said fourth wall is flat;  
2           wherein said fourth wall is parallel to said first wall;  
3           wherein said fourth wall is parallel to said second wall; and  
4           wherein said fourth wall is parallel to said third wall.

1       16. The connector as defined in claim 6, wherein said fourth wall has a drill rail;  
2            wherein said drill rail extends said length of said connector;  
3            wherein said drill rail is for preventing a self-tapping sheet metal screw being screwed  
4            into said fourth wall from skipping thereacross; and  
5            wherein said self-tapping sheet metal screw is for screwing into said fourth wall, the  
6            first piece of sheet metal, said first wall, the second piece of sheet metal, and said third  
7            wall if required in order to comply to a local building code.

1       17. The connector as defined in claim 14, wherein said flange is flat.  
2            wherein said flange extends outwardly from said terminal edge of said fourth wall to  
3            a free edge;  
4            wherein said flange extends in a direction away from said first wall;  
5            wherein said flange extends in a direction away from said second wall;  
6            wherein said flange extends in a direction away from said third wall;  
7            wherein said flange has a free edge;  
8            wherein said free edge of said flange is folded onto itself in a direction away from said  
9            ledge so as to form a folded free edge;  
10          wherein said folded free edge of said flange further structurally stiffens said connector;  
11          and  
12          wherein said folded free edge of said flange is for eliminating a sharp edge.

1       18. The connector as defined in claim 7, wherein said first wall extends said length of said  
2            connector;  
3            wherein said second wall extends said length of said connector;  
4            wherein said third wall extends said length of said connector;

5       wherein said ledge extends said length of said connector;  
6       wherein said fourth wall extends said length of said connector; and  
7       wherein said flange extends said length of said connector.

1       19.      The connector as defined in claim 7, wherein said flange has a height; and  
2                wherein said height of said flange is directly proportional to said length of said  
3                connector.

1       20.     The connector as defined in claim 19, wherein said height of said flange is in a range  
2                of approximately  $\frac{3}{8}$  inches to approximately  $1\frac{3}{8}$  inches.

1       21.     Two pieces of sheet metal for being joined together end-to-end by a connector,  
2                wherein the connector has a first wall, a second wall, a ledge, and a third wall, wherein  
3                the second wall of the connector and the first wall of the connector define a first  
4                channel therebetween, wherein the ledge of the connector extends inwardly from the  
5                second wall of the connector, into the first channel of the connector, wherein the third  
6                wall of the connector terminates in a free edge, wherein the free edge of the third wall  
7                of the connector is folded inwardly onto itself so as to form a folded free edge, wherein  
8                the third wall of the connector and the first wall of the connector define a second  
9                channel therebetween, wherein the first channel of the connector and the second  
10                channel of the connector open in opposite directions from each other, and wherein the  
11                first channel of the connector and the second channel of the connector are offset  
12                relative to each other, said two pieces of sheet metal comprising:  
13                a)        a first piece of sheet metal; and  
14                b)        a second piece of sheet metal;

15 wherein said first piece of sheet metal has a raw free end;

16 wherein said raw free end of said first piece of sheet metal has at least one wedge-

17 shaped reverse button lock projection thereon;

18 wherein said second piece of sheet metal has a raw free end;

19 wherein said raw free end of said second piece of sheet metal has at least one wedge-

20 shaped reverse button lock projection thereon;

21 wherein said raw free end of said second piece of sheet metal has a joggle;

22 wherein said joggle is inward of said at least one wedge-shaped reverse button lock

23 projection on said raw free end of said second piece of sheet metal;

24 wherein said joggle on said raw free end of said second piece of sheet metal offsets

25 said second piece of sheet metal for allowing insertion of the other raw free end of said

26 second piece of sheet metal into the first channel of a next connector without a need

27 for field dressing;

28 wherein said raw free end of said first piece of sheet metal is for being lockingly

29 received in the first channel of the connector by virtue of said at least one wedge-

30 shaped reverse button lock projection on said raw free end of said first piece of sheet

31 metal spreading the second wall of the connector away from the first wall of the

32 connector as said raw free end of said first piece of sheet metal slips through the first

33 channel of the connector until such time as said at least one wedge-shaped reverse

34 button lock projection on said raw free end of said first piece of sheet metal just clears

35 the ledge of the connector causing the second wall of the connector to unspread, and

36 in so doing, causes said at least one wedge-shaped reverse button lock projection on

37 said raw free end of said first piece of sheet metal to be snapingly engaged onto, and

38 lockingly captured against, the ledge of the connector, and in so doing, said first piece

39 of sheet metal is secured in the connector;

40 wherein said raw free end of said second piece of sheet metal is for being lockingly  
41 received in the second channel of the connector by virtue of said at least one wedge-  
42 shaped reverse button lock projection on said raw free end of said second piece of  
43 sheet metal spreading the third wall of the connector away from the first wall of the  
44 connector as said second piece of metal slips through the second channel of the  
45 connector until such time as said at least one wedge-shaped reverse button lock  
46 projection on said raw free end of said second piece of sheet metal just clears the  
47 folded free edge of the third wall of the connector causing the third wall of the  
48 connector to unspread, and in so doing, causes said at least wedge-shaped reverse  
49 button lock projection on said raw free end of said second piece of sheet metal to be  
50 snapingly engaged onto, and lockingly captured against, the folded free edge of the  
51 third wall of the connector, and in so doing, said second piece of sheet metal is secured  
52 in the connector.

1      22. A connector for securely receiving a piece of sheet metal, wherein the piece of sheet  
2      metal has a raw free end with at least one wedge-shaped reverse button lock projection  
3      thereon, said connector comprising:  
4            a)      a first wall;  
5            b)      a second wall;  
6            c)      a ledge; and  
7            d)      a third wall;  
8      wherein said second wall and said first wall define a channel therebetween;  
9      wherein said ledge extends inwardly from said second wall;  
10     wherein said ledge extends into said channel;

11 wherein said channel is for lockingly receiving the raw free end of the piece of sheet  
12 metal by virtue of the at least one wedge-shaped reverse button lock projection on the  
13 raw free end of the piece of sheet metal spreading said second wall away from said  
14 first wall as the raw free end of the piece of sheet metal slips through said channel until  
15 such time as the at least one wedge-shaped reverse button lock projection on the raw  
16 free end of the piece of sheet metal just clears said ledge causing said second wall to  
17 unspread, and in so doing, causes the at least one wedge-shaped reverse button lock  
18 projection on the raw free end of the piece of sheet metal to be snapingly engaged onto,  
19 and lockingly captured against, said ledge, and in so doing, the piece of sheet metal is  
20 secured in said connector;

21 wherein said third wall has a raw free end;

22 wherein said raw free end of said third wall is for insertion into said channel of a next  
23 connector;

24 wherein said third wall has a joggle thereon;

25 wherein said joggle is inward of said raw free end of said third wall; and

26 wherein said joggle on said third wall offsets said third wall so as to allow insertion  
27 of said raw free end of said third wall into said channel of said next connector without  
28 a need for field dressing.

- 1 23. A connector for joining a first piece of sheet metal and a second piece of sheet metal  
2 together end-to-end, wherein said connector has a length and a longitudinal center line,  
3 wherein the first piece of sheet metal has a raw free end with at least one wedge-  
4 shaped reverse button lock projection thereon, and wherein the second piece of sheet  
5 metal has a joggle thereon, said connector comprising:
  - 6 a) a first wall;

7           b)     a second wall;

8           c)     a ledge; and

9           d)     a third wall;

10          wherein said second wall and said first wall define a first channel therebetween;

11          wherein said ledge extends inwardly from said second wall;

12          wherein said ledge extends into said first channel;

13          wherein said first channel is for lockingly receiving the raw free end of the first piece

14          of sheet metal by virtue of the at least one wedge-shaped reverse button lock projection

15          on the raw free end of the first piece of sheet metal spreading said second wall away

16          from said first wall as the raw free end of the first piece of sheet metal slips through

17          said first channel until such time as the at least one wedge-shaped reverse button lock

18          projection on the raw free end of the first piece of sheet metal just clears said ledge

19          causing said second wall to unspread, and in so doing, causes the at least one wedge-

20          shaped reverse button lock projection on the raw free end of the first piece of sheet

21          metal to be snapingly engaged onto, and lockingly captured against, said ledge, and in

22          so doing, the first piece of sheet metal is secured in said connector;

23          wherein said third wall terminates in a free edge;

24          wherein said free edge of said third wall is folded inwardly onto itself so as to form a

25          folded free edge;

26          wherein said third wall and said first wall define a second channel therebetween;

27          wherein said second channel is for lockingly receiving the raw free end of the second

28          piece of sheet metal;

29          wherein said first channel and said second channel open in opposite directions from

30          each other for joining the first piece of sheet metal and the second piece of sheet metal

31          together end-to-end; and

32 wherein said first channel and said second channel are offset relative to each other, and  
33 as a result thereof, requires the joggle on the raw free end of the second piece of sheet  
34 metal to offset the second piece of sheet metal so as to allow insertion of the other raw  
35 free end of the second piece of sheet metal into said first channel of a next connector  
36 without a need for field dressing.